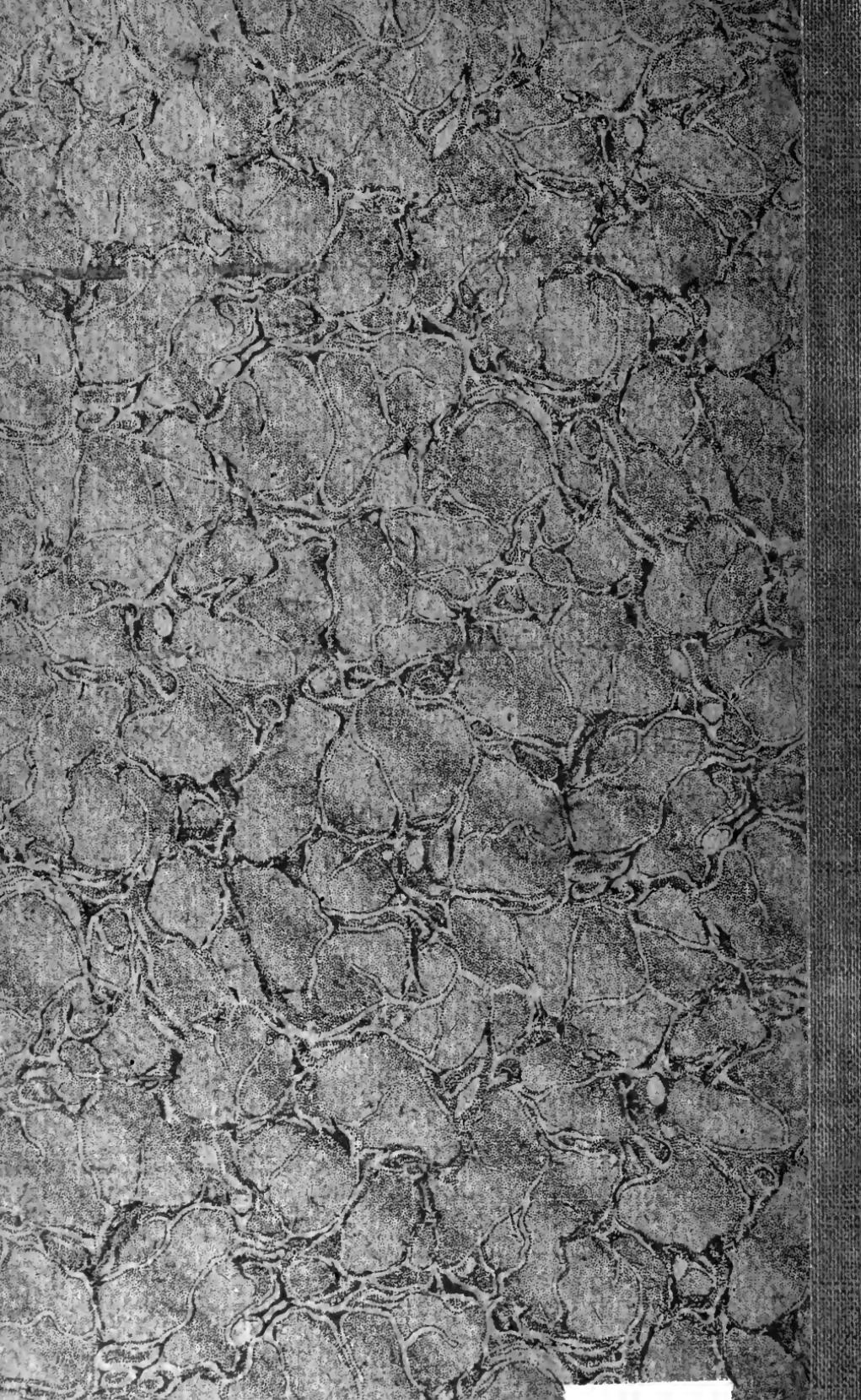


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CALIFORNIA RAILROAD COMMISSION

General Program

on

**Investigation of the Grade Crossing Problem
in California to be Undertaken
by the Commission**

JANUARY, 1916

Your Active Co-operation is Earnestly Requested



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STATE PRINTING OFFICE
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GENERAL PROGRAM.

INVESTIGATION OF GRADE CROSSING CONDITIONS IN CALIFORNIA.

Grade Crossing Problem in California.

During the year ended June 30, 1914, the railroads reporting to the Interstate Commerce Commission killed and injured 4,900 people at grade crossings; and the number of deaths and injuries is yearly increasing in spite of the efforts being made to decrease these figures. The railroads in addition to spending millions of dollars to separate grades to protect crossings have been making a determined campaign to educate their employees and the public to the dangers of crossings. Many states, especially in the east, have appropriated large sums of money to assist local bodies and the railroads in separating grades, and one of them, New Jersey, has passed a law prohibiting the construction of new grade crossings and requiring the existing grade crossings to be gradually eliminated. Flagmen and gates have been installed by thousands, and the old type of crossing bell has given place to the more effective automatic flagman; but in spite of all these things the number of accidents is increasing.

The grade crossing conditions in California are worse than in any other state in the Union. In 1914, California with less than 4 per cent of the population of the country and less than 2 per cent of the steam railway mileage, furnished nearly 5 per cent of the deaths and injuries reported to the Interstate Commerce Commission as resulting from grade crossing accidents on steam railroads.

This result is the natural outcome of conditions which have brought about the increase in grade crossing accidents in recent years. Before the coming of the automobile, traffic on the highways was carried on by horse-drawn vehicles at a speed which rarely exceeded ten miles per hour and which probably averaged less than five. On account of the limitations of the horse, drivers were generally in territory which was so familiar to them that they knew where each crossing was located, its condition and surroundings, and were often even familiar with the timetables of the railroads. In the country, because many horses were unused to trains, drivers as a rule desired to be as far away as possible from a crossing when a train passed over it.

This has all been changed. The coming of the automobile has vastly increased the mileage of good roads and the two together have made it possible for much traveling to be done in territory unfamiliar to

the traveler, while the speed of traffic on the roads has been greatly increased. During this period in which the automobile was developing, there has developed also a healthy desire on the part of those who work in the cities to live in the suburbs, and this has led to the construction of interurban roads and the use of high-speed cars upon them, as well as additional high-speed service on the steam railroads. Population in and about the larger cities has also greatly increased during this time, and the traffic on both rail and road has been intensified by this growth.

The situation in California is peculiarly unfavorable to satisfactory grade crossing conditions. The State ranks third in the number of its automobiles. It will compare favorably with any state in the mileage of its improved roads. It has a large automobile tourist traffic unfamiliar with its highways, and it has a climate which permits the use of automobiles every day during the year. Its suburban trains, especially in the south, are numerous and run at high speeds, and the topography of the country in the valleys where the population is greatest, train service most frequent and improved highways most numerous, rarely permits of grade separations being made without the expenditure of large sums of money. In these valleys, also, fruit orchards are plentiful and grade crossings are often concealed by the trees at the intersections of the railroads and highways.

The following table shows the accidents which have happened at grade crossings in California, by years, from June 30, 1912, to June 30, 1915. Statistics for previous years are lacking:

	Year ending June 30, 1913			Year ending June 30, 1914			Year ending June 30, 1915		
	Electric	Steam	Total	Electric	Steam	Total	Electric	Steam	Total
Killed -----	38	45	83	46	47	93	39	34	73
Injured ----	185	192	377	228	150	378	215	123	338

A decrease of over 12 per cent in the total number of those injured during 1915 as against 1914 would indicate that crossings are safer now than they were a year ago; and the work of the Commission in refusing new crossings and in safeguarding others has undoubtedly permanently improved conditions to a certain extent, but the decrease in the number of accidents must be attributed more to the safety first campaigns carried on by the railroads than to any other factor.

If the effect of a safety first campaign were permanent the crossing problem would be much simplified. It is, however, not permanent, but is of exceedingly short duration upon the public, although it may be more or less permanent among employees of railroads who can secure a certain amount of credit for safety first suggestions and

methods. But grade crossing accidents are rarely the result of carelessness on the part of railroad employees, and even with perpetual campaigns among the public they will in time cease to be effective to a large extent, and the best that can be done, in addition to permanent "safety first" movements, is to offset in various ways the increase in the liability of accidents caused by the additional crossings which must be opened, by the increase in the mileage of railroads and good roads, and by the great increase in the number of automobiles, as the price of machines is continually lowered and they become available to a greater number of people.

The fact that during the six months ended December 31, 1915, 265 people were killed and injured at grade crossings in the State, is sufficient evidence that the effectiveness of past "safety first" campaigns is dying away. This is at the rate of 530 killed and injured per year as against 411 for the previous year, or an increase of 29 per cent, and is sufficiently and strikingly illustrative of the importance of the problem in California, and shows the need of urgent action on the part of those who are in a position to aid in stopping this increase in waste of human life.

There are in California probably 10,000 grade crossings. Steam railroads reporting to the Interstate Commerce Commission have alone listed 7,500 crossings in the State. But few of these crossings are protected. Around many of them trees, brush, buildings and billboards so obscure the approaches that they are a constant menace to the safety of every user of the highway. Others are so close to adjacent crossings that they invite road traffic needlessly to cross and recross the tracks when other routes are available which are free from crossings. Still others are so located that they serve no public convenience whatever, and it is often these neglected and little used crossings that are responsible for the most serious accidents.

What Can Be Done?

To separate grades at all the crossings in California on the basis of the very low figure of \$30,000 per crossing, would cost some \$300,000,000. Interest on this sum at 6 per cent would amount to \$18,000,000 per annum, or an annual per capita tax on the people of the State of \$6.00. Plainly any movement to separate all grade crossings in the State is entirely out of the question. There remains, then, only the possibility of improving the conditions surrounding grade crossings, making separations in extreme cases only and as a last resort.

There are many ways in which grade crossings can be improved. During the year ended June 30, 1915, 55 per cent of the deaths and

injuries received at grade crossings were chargeable to automobiles. While the purpose is to protect traffic in general, it is manifest from these figures that automobile traffic is of such a character that when adequate protection is afforded for this class of traffic, all other traffic will be amply protected also. The first thing to be done in improving the grade crossing situation is to see to it that the cautious and careful driver is given every chance to safeguard his passage over a crossing, and this can be done by any type of a sign which will warn him sufficiently in advance that he is approaching a crossing. Unfortunately careful drivers are comparatively few in numbers. The reckless drivers make the largest contribution to the accident statistics and they can be protected only by making crossings "fool-proof"—by making it physically impossible for an automobile and a train to come together—and as this means grade separations, it is, of course, out of the question on a large scale. The average driver who forms the largest class is not a careful driver, nor, on the other hand, is he wantonly reckless; but statistics show that he fails to exercise care in safeguarding his passage over railroad crossings, and it is principally for him that grade crossings should be improved and protected.

One of the first things to be done is to remove obstructions to the view where they exist and can be removed. When they can not be removed and when traffic warrants, ample warning signals can be installed in such a conspicuous place that it will be impossible for them to be overlooked. At unusually dangerous crossings approach warning signs can be placed. In cities the installation of human flagmen or gates can protect all except those who take no pains to protect themselves. Grades of approach can be flattened where they are now too steep to enable drivers to keep control of their machines, and the physical conditions of crossings can be improved so that drivers can devote all their attention to watching for approaching trains without being diverted in an attempt to choose a smooth road over the tracks. But the best step that can be taken in improving the grade crossing situation is in closing crossings which are not absolutely needed. Grade crossings will eventually be abolished, and every grade crossing in existence, when that time comes, will mean an expenditure of from \$30,000 to five times that sum or more, and regardless of who furnishes the money in the first instance, the cost will finally rest on the people of the State.

At the present time many crossings could be closed without present or future inconvenience to the public, while twenty years from now, or even in much less time, it will be impossible to do away with them.

What the Commission Proposes to Do.

Sections 42, 43 and 44 of the Public Utilities Act, taken together, make the Railroad Commission more or less responsible for the safety of grade crossings, and under the authority conferred upon it in those sections it proposes to take active steps to improve conditions at crossings throughout the State. It proposes to make a thorough investigation of the situation, which will include a survey of each crossing and of the traffic that uses it, and from the data secured it proposes to have the crossings safeguarded in all of the various ways in which it can be done. This is a large and important undertaking, and it is apparent that the Commission can accomplish little without the help and co-operation of the officials of the towns, cities and counties, as well as of the carriers, and that it will need all the assistance it can secure from other sources. To arouse interest in this work it proposes to hold five general hearings throughout the State to discuss the matter with the officials of the political bodies, the carriers and others interested in the subject, and it believes that such a free discussion will not only be of great value to it in securing the suggestions of others but will be of great benefit as a "safety first" meeting, which will bring home to the public the great dangers of grade crossings and the importance of the grade crossing problem.

It has been tentatively decided that the entire Commission will hold these hearings in Sacramento, Los Angeles, San Diego, Fresno and San Francisco during the month of February. Special invitations will be sent to the officials of political bodies and carriers and notices of these hearings will be given in the press. It is the Commission's hope that a large number of citizens will attend these hearings and offer such suggestions as they may wish to make.

The program to be adopted following the general hearings will depend largely on what is there developed and the willingness of the public officials and the officials of the carriers to help the Commission in this matter. Tentatively, it is decided that following this general hearing the State will be divided into districts, and further hearings will be held in each of these districts to which will be invited representatives of the carriers, the towns, cities, and counties, representatives of automobile clubs, county highway commissions, the State Highway Commission, improvement and commercial clubs and others who may be interested.

The following list shows the territory included in the districts considered and the location of the place of hearing:

List of Grade Crossing Investigation Districts.

No.	Counties included	Place of hearing
1	Del Norte, Humboldt, Trinity-----	Eureka.
2	Siskiyou, Shasta, Tehama-----	Redding.
3	Modoc, Lassen, Plumas, Sierra, Nevada, Placer, El Dorado, Yolo, Sacramento, Amador-----	Sacramento.
4	Glenn, Butte, Colusa, Sutter, Yuba-----	Colusa.
5	Mendocino, Sonoma, Marin-----	Santa Rosa.
6	Napa, Solano -----	Napa.
7	City and County of San Francisco, San Mateo-----	San Francisco.
8	Alameda -----	Oakland.
9	Contra Costa -----	Martinez.
10	San Joaquin, Calaveras-----	Stockton.
11	Santa Clara, Santa Cruz, San Benito, Monterey-----	San Jose.
12	Stanislaus, Tuolumne, Mariposa, Merced-----	Merced.
13	Madera, Fresno -----	Fresno.
14	Kings, Tulare -----	Visalia.
15	San Luis Obispo-----	San Luis Obispo.
16	Kern -----	Bakersfield.
17	Santa Barbara, Ventura-----	Santa Barbara.
18	Los Angeles -----	Los Angeles.
19	San Bernardino, Riverside-----	San Bernardino.
20	Orange -----	Santa Ana.
21	San Diego -----	San Diego.
22	Imperial -----	El Centro.

NOTE.—Lake County and Alpine County are not included in this list, there being no railroads in either of these counties.

At these hearings the co-operation of the carriers and the public officials will be asked for and their support and assistance solicited in forwarding and helping the Commission's engineering department on the surveys to be undertaken, and in securing information as to crossings considered dangerous or public highways it may be possible to have closed. Ways and means of procuring this information will be discussed, and the possibility of securing it jointly by the representatives of the carriers, public officials and the Commission, will be considered. These hearings will be somewhat similar to the general hearings, but will go more into details and deal with specific matters rather than with a general program.

There is hardly a doubt but that surveys should be made of all crossings. It has been found to be the first prerequisite of a consideration of grade crossing matters in the states which have commissions with jurisdictions over crossings, and it is only reasonable that such findings as the Commission may make on the problem in this State should be based on sufficient data to enable it to view the situation as a whole. When the surveys are completed for any district reports will be made which will cover crossing conditions on one railroad in one political subdivision only. That is, each railroad within the limits of

an incorporated town or city, or the unincorporated territory in a county, will be considered as a unit for the purposes of these reports. If it is found impossible to make joint reports on the part of all concerned, the reports made by our engineering department will be sent to the interested parties. In addition to the information developed by the survey they will contain the definite recommendation of our engineers for crossing improvements and for crossings which they consider should be closed; and the officials of the carriers and the political corporations will have ample opportunity to look them over and make such criticisms and suggestions as occur to them. If they approve the recommendations contained therein, the Commission hopes that they will be adopted and carried out. If there are objections made to these recommendations by either the carriers or the political bodies, a formal hearing can be held, if necessary, and the Commission will consider the points at issue and make such orders as appear to be right and just in the premises.

This, in brief, is the program the Commission has tentatively adopted, and that if carried out it will result in greatly increased safety and a large lessening of the loss of life in grade crossing accidents can not be doubted.

It is equally beyond doubt that what the Commission can do alone in the matter will be small compared with what it can do if the representatives of the public and the carriers co-operate with it and assist it either in carrying out this program or any other that may be substituted for it after the general hearings have been held.

What Others Can Do to Help in This Work.

The responsibility for the existence of grade crossings is mutual as between the public and the railroads. The responsibility for the accidents which occur upon them is mutual, and the improvement of existing conditions should be a mutual work. As the grade crossings exist today, each crossing means to the railroad potential damage suits, unsatisfactory safety conditions and a long list of killed and injured; to the railroad officials it means a source of constant worry; to the towns, cities and counties it is a menace to the lives of their citizens; and to every individual it is a serious danger.

The crossing situation in this State can be vastly improved at a comparatively small expenditure of money and effort, and the public and the carriers should bear their fair share of each. The railroads can assist in this work by showing a willingness to promote it in its early stages by helping the Commission's engineers in the surveys proposed and by extending the attitude they have manifested toward new crossings to the work of protecting those that are now in existence.

The officials of the towns, cities and counties, by attending the hearings, taking part in the discussions and assisting in the surveys by calling attention to dangerous crossings or those that can possibly be closed, can assist in this work from the start. Later, by willingness to bear part of the cost of such improvements as are decided upon, by a willingness to assist in closing roads which do not serve an actual public convenience, they can be of much more assistance. As a matter of fact, the towns, cities and counties are prepared to do much of the work, which it will be necessary to do, cheaper and better than can the railroad companies. This is especially true where such work involves negotiations with property owners. As an instance of this, the county can far better take steps to remove brush and trees on private property, at an intersection of a highway and railroad, than can the railroad company, and the same is true of the city officials in removing in cities such obstructions as billboards and fences, and in seeing to it that attention is paid to the grade crossing question in the laying out of new subdivisions and real estate tracts.

Revision of crossing grades of approach outside of railroad rights of way is also a matter in which the public officials can justly assume the expense, and many other similar examples might be mentioned.

CONCLUSION.

In spite of any action that may be taken to make grade crossings safer, there will still be many grade crossing accidents caused by carelessness, for the present means of protecting grade crossings are entirely inadequate to protect those who will not protect themselves. That automatic flagmen, crossing gates and human flagmen have apparently but little effect upon the reckless driver is shown by the fact that 30 per cent of the total killed and 15 per cent of those injured at grade crossings in this State this year were hit by trains at crossings where gates were down, crossing bells were ringing, automatic flagmen were in action, or human flagmen were at their stations. Sixteen people were injured during this period by vehicles which ran into trains on crossings. Many of these trains were standing still when the accident occurred.

The Southern Pacific Company in a recent examination of thirty-four crossings in all parts of the State observed the attitude of over 17,000 motor drivers in crossing the tracks. But 27.8 per cent looked in both ways for approaching trains; 2.7 per cent looked in one direction only; and 69.5 per cent looked in neither direction; 3,300 crossed the track at a reckless speed, and but thirty-five out of the more than 17,000 drivers stopped their vehicles to look along the track before crossing it.

The same company has reported that during the two years ended June 30, 1915, 525 crossing gates were broken down by vehicle drivers. Since these gates are down only when a train is approaching, in other words when it is dangerous to be on the track, this fact is a speaking commentary on one phase of the subject that should be considered, that is, the education of the reckless driver.

The railroads of the State deserve a great deal of credit for the "safety first" campaigns they have carried on in the past and are now carrying on. It is the belief of the Commission that the movement it is now undertaking will be effective along these same lines, and it will endeavor to give wide publicity to that movement to the end that it may bring home to the careless automobile driver and impress upon his mind some of the facts that have just been cited. If he can not be protected by grade separations he can at least be repeatedly warned of the dangers he incurs.

Grade separations, as has been said before, are the eventual solution of the crossing problem, but that solution is many years in the future. Until that time comes the public and the carriers must unite to mitigate the dangers of the grade crossing. They should both be prepared to expend money to close or protect them. Public officials must ask for no more crossings than are absolutely necessary, and must examine the roads and streets through new subdivisions which they are asked to accept as public streets and highways, and refuse to accept them if they include needless railroad crossings. "Safety First" campaigns must be continually carried on, and nothing must be omitted which will tend to decrease the number of accidents.

The Commission expects to take an active part in this important work, and it hopes the investigation it is about to undertake will have the effect of (1) making all crossings safe for the careful driver; (2) of educating the careless driver to the dangers he incurs at crossings; and (3) of affording all possible safeguards at crossings for the large majority of drivers who are neither careful nor reckless.

CALIFORNIA RAILROAD COMMISSION,

MAX THELEN, President.

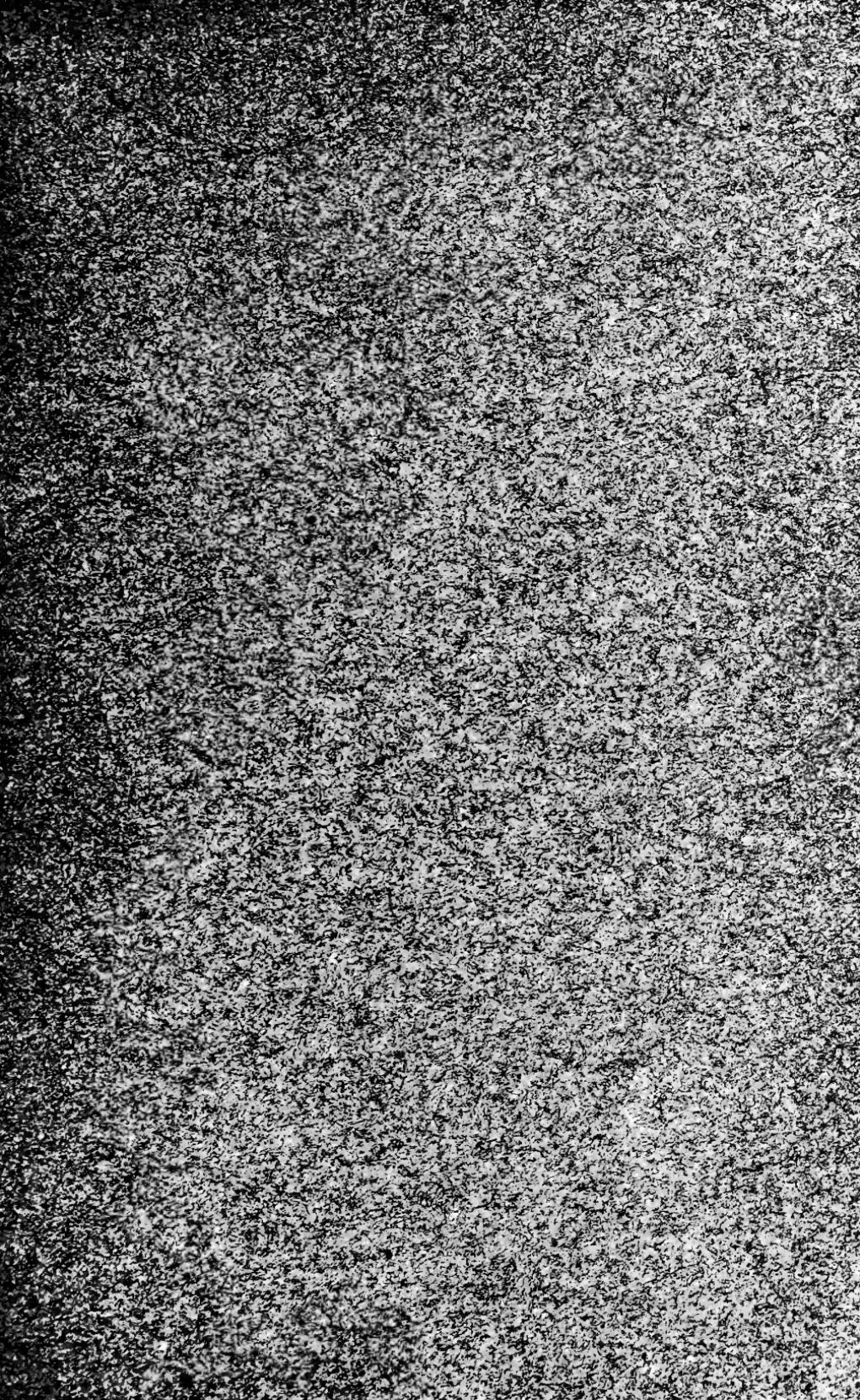
H. D. LOVELAND, Commissioner.

ALEX GORDON, Commissioner.

EDWIN O. EDGERTON, Commissioner.

FRANK R. DEVLIN, Commissioner.

San Francisco, January 15, 1916.



DEC 29

